Adjusted least squares estimator for algebraic hypersurface fitting

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We consider the problem of fitting a set of points in Euclidean space by an algebraic hypersurface. We assume that the points on a "true" hypersurface are corrupted by Gaussian noise, and we estimate the coefficients of the "true" polynomial equation. The adjusted least squares estimator accounts for the bias present in the ordinary least squares estimator. The adjusted least squares estimator is based on constructing a quasi-Hankel matrix, which is a bias-corrected matrix of moments. For the case of unknown noise variance, the estimator is defined as a solution of a polynomial eigenvalue problem. In this talk, we present new results on invariance properties of the adjusted least squares estimator and an improved algorithm for computing the estimator for arbitrary set of monomials in the polynomial equation.

References

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